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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/275,808 03/25/99 KANG

S SEC.626

MM22/0210  
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EXAMINER

PERALTA, G

ART UNIT

PAPER NUMBER

2814

DATE MAILED:

02/10/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

## Office Action Summary

**Application No.**

09/275,808

**Applicant(s)**

KANG ET AL.

**Examiner**

Ginette Peralta

**Art Unit**

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 December 1999.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some \* c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☒ received.
2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_\_.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

### Attachment(s)

- 14) ☐ Notice of References Cited (PTO-892)
- 15) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 16) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 17) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 18) ☐ Notice of Informal Patent Application (PTO-152)
- 19) ☐ Other: \_\_\_\_\_

Art Unit: 2814

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 1, 4, 5, 6, 7, 11, 13, 14, 16 and 17 are objected to because of the following informalities:

The phrase "HSG" when first referred to in the claims it should be properly stated as "hemispherical grain (HSG)", the phrase "ambient temperature" should read "temperature of the reacting chamber ambient", and the term "ambient" should read "reacting chamber ambient".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 7 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Han et al. (U.S. Pat. 5821,152).

Han et al. teaches in Figure 6 a method for forming a capacitor electrode that comprises the steps of forming a first HSG nuclei on a conductive layer pattern by introducing a first amount of a source gas into the reacting chamber while an ambient temperature stabilizes within a first temperature, forming a second HSG nuclei over the first HSG nuclei by introducing a second amount of the source gas into the reacting chamber after the ambient temperature stabilizes within the first temperature range to form a resulting structure, and annealing the resulting structure.

Art Unit: 2814

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1 to 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Han et al. (U.S. Pat. 5,821,152) in view of Tatsumi et al. (U.S. Pat. 5,385,863).

Han et al. teaches in Figure 6 a method for forming a capacitor electrode that comprises the steps of forming a first HSG nuclei on a conductive layer pattern by introducing a first amount of a source gas into the reacting chamber while an ambient temperature stabilizes within a first temperature, forming a second HSG nuclei over the first HSG nuclei by introducing a second amount of the source gas into the reacting chamber after the ambient temperature stabilizes within the first temperature range to form a resulting structure, and annealing the resulting structure, the first HSG nuclei radii are smaller than the second HSG nuclei, the source gas may be silane ( $\text{SiH}_4$ ) gas or disilane ( $\text{Si}_2\text{H}_6$ ) gas. The first temperature range taught by Han et al. is from 570°C to 600°C.

Han et al. discloses the claimed invention except the amount of the source gases used, the internal pressure of the reacting chamber, the step of preheating the first amount of source gas and a first temperature range of 200°C to 500°C.

However, the source gas introduced into the reacting chamber is typically preheated.

Art Unit: 2814

Tatsumi et al. teaches a method of fabricating a polysilicon film comprising forming a HSG nuclei in a reaction chamber with internal pressure kept at  $1 \times 10^{-9}$ , a temperature range of 500° to 620°C (Col. 6, l. 29-35), and a flow rate of 2 sccm (Col. 7, l. 40-44).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the different conditions of the HSG nuclei formation as taught by Tatsumi et al., since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Furthermore, it is inherent that the second amount of the source gas is larger than the first amount of the source gas because the grain size depends on the source gas available, and it is taught by Han et al. that the first HSG nuclei are smaller than the second HSG nuclei, thus the first amount of source gas is smaller than the second amount of source gas.

### ***Response to Arguments***

6. Applicant's arguments filed 12/10/99 have been fully considered but they are not persuasive.

In response to Applicant's argument that the claims are distinguishable from the Han et al. patent by requiring steps of forming HSG nuclei by introducing the source gas into the reacting chamber while the ambient temperature is stabilizing, it is noted that

Art Unit: 2814

the temperature within a system is always fluctuating when gas is introduced, therefore the system undergoes stabilizing while gasing.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ginette Peralta whose telephone number is (703)305-7722. The examiner can normally be reached on Monday to Friday 8:00 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald L. Monin can be reached on (703)308-4895. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7724 for After Final communications.

Art Unit: 2814

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

GP  
February 8, 2000

**Donald L. Monin, Jr.**  
**Primary Examiner**